

The first measurements made by me were on January 9, 1903, when I found the faint reddish ring extending from between  $25^{\circ}$  and  $30^{\circ}$  to about  $40^{\circ}$  from the sun, the mean distance being about  $33^{\circ}$ . On January 20 several measurements made with an altazimuth instrument gave the mean distance of the middle of the red ring as  $30^{\circ}$  (see *Science*, N.S., vol. xvii. p. 150, January 23, 1903). On February 24, measured by an altazimuth instrument, the reddish glow extended from  $26^{\circ}$  to  $31^{\circ}$  from the sun, the mean being about  $29^{\circ}$ . On May 13 the average distance of the middle of the ring was by measurement roughly about  $30^{\circ}$ . On June 26 it was found to be about  $26^{\circ}$  from the sun. All these measurements were made at Blue Hill between 10 a.m. and 2 p.m., and the distance was measured from the sun vertically upward to the ring.

On September 1 Mr. Rotch, when on the summit of Mont Blanc, measured the distance of the ring from the sun, and found it to be between  $20^{\circ}$  and  $25^{\circ}$ , which would give a mean distance of about  $23^{\circ}$  (NATURE, vol. lxxviii. p. 623).

On October 14 I again measured it at Blue Hill with a sextant, and found it extended out to  $26^{\circ}$ , which would give a mean distance of about  $23^{\circ}$ . A recent measurement by me on December 28 with an altazimuth instrument showed that it extended from about  $16^{\circ}$  to  $24^{\circ}$  from the sun, giving a mean distance of  $20^{\circ}$ .

Putting these measurements together, the following results are obtained:—

1902		1903							
Aug.	Dec.	Jan.	Feb.	May	June	Sept.	Oct.	Dec.	
$70^{\circ}$	...	$40^{\circ}$	...	$32^{\circ}$	...	$29^{\circ}$	...	$30^{\circ}$	...
						$26^{\circ}$	...	$23^{\circ}$	...
								$23^{\circ}$	...
									$20^{\circ}$

These results show a very rapid decrease in size at first, followed by a diminishing rate of decrease.

When I began my measurements I had not seen the letter of Mr. Backhouse, and did not see it until about a month ago. I anticipated that the ring would grow larger with time, reasoning that if the ring was a diffraction phenomenon, due to volcanic dust, the larger particles of dust would fall first to earth, leaving the smaller particles, and theoretically this ought to increase the size of the ring. I have been surprised to see the ring grow smaller. Perhaps it is because the whole of the particles causing it are getting nearer to the ground. Inside the very faint reddish ring described above, is a whitish glare which is visible to everyone, but I find that many people are unable to distinguish the reddish ring, which is very faint, and only distinguishable by anyone on the clearest days, and is most distinct when the sun itself is hidden by a cloud.

HENRY HELM CLAYTON.

Hyde Park, Mass., December 30, 1903.

#### Subjective Images.

WILL you kindly allow me to submit the following case for the consideration of your readers? I was reading a book one day in the open air, and the full light of a strong sun was shining on the printed page. After reading for about half an hour, I went over to a fountain, a few yards distant, in the shade of some trees. On a white marble slab attached to the fountain, there was an inscription, which I knew to be in jet black letters. To my surprise, the letters now appeared to my eye a rich emerald green. So brilliant and persistent was this green that I thought, for a time, that the colour had been really changed. After a few minutes, however, the green hue slowly faded away, and the letters appeared black as before.

The explanation that occurs to me for the moment is that the impression made on the retina by the different colours present in white light, lasts longer for some colours than for others, and that it lasts longest for the green. Thus the retina having been exposed for a considerable time to an intense white light, retained the impression of green after the impressions made by the other colours had faded away, and accordingly those portions of the retina on which the image of the black letters fell would still produce the sensation of green, while that sensation would be practically effaced for the remainder of the retina by the strong white light of the marble slab. It would be interesting, I think, if any of your readers could give evidence of a similar experience, or offer any better explanation of the phenomenon.

GERALD MOLLOY.

86 Stephen's Green, Dublin.

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#### National Science Scholarships.

As a former student of the Royal College of Science and School of Mines, London, S.W., I was much struck by the hard working, studious demeanour of the national scholars I came into contact with at this excellent institution, and it seems to me that they are deserving of a better fate than being compelled to exist in London and to find many college necessities out of 25s. per week, which I understand is only paid them during term time (p. 237). I am proud to be able to number several of these fine fellows among my intimate friends, whose mental calibre makes their companionship an acquisition; the miserable pittance doled out would seem hardly likely to attract such material, and seems to me only calculated, in many cases, to crush the element it professes to foster, and to turn out drudges for the general use and convenience of others possessing healthier digestions and a more extended knowledge of the world in general.

In this age of educational raving, when, apparently, it is assumed that the expenditure of large sums of money on the erection of colossal buildings is the surest way of building colossal minds, it makes one hesitate and wonder what education of any kind means.

Surely the object of scholarships should be two-fold, or more than two-fold, to make *men*, as well as *men of science*, and to educate in accuracy and truthfulness, and manliness also, and not to make mental and physical wrecks by ignoring earthly needs, yet the latter must result in many cases from such false economy. Either the scholarships should be made sound in every way or they should be abolished; the country would at any rate gain by a reasonable number of healthy minded citizens, which no nation can afford to despise in the race of life as it goes on to-day.

I think your suggestion of suitable halls and corporate life a good one; it is a need of the Royal College of Science, it is in fact, a need of all large colleges and universities drawing students from the various quarters of the Empire. The system of halls for a college should, in my opinion, be in miniature representative of the colleges of Cambridge and Oxford, a system which has probably assisted in maintaining the pre-eminence of these universities more than one is at first sight prepared to admit. Each unit belonging to the mother institution striving to obtain good men and fostering them by every encouragement to work for the hall they represent, let each hall have its cherished list of names of prizemen, and thus convert what, in a simple college not possessing such units, becomes a system of pace-making into a healthy, manly, and sportsmanlike competition, in which the honour of the hall is at stake equally with that of the individual, where each will do his best work and be free from that tendency on the part of many high minded individuals to condemn themselves for entering into direct competition with less healthy, less capable men who nevertheless possess qualifications which make them respected by all to whom they are known, for the honour of the hall is a thing apart from self. Such a system would, I believe, tend to advance greatly the beloved institution which many others and myself regard as Alma Mater.

Bedford, January 14.

W. H. PRETTY.

#### The Transvaal Technical Institute.

IN view of various unauthorised statements which have appeared from time to time in the public Press, the council of the Transvaal Technical Institute will be obliged if you will give publicity to the following particulars regarding the arrangements which have been made to meet the needs of this community and of South Africa generally in respect of technical education.

The classes for mining students which for seven years past have been held at Kimberley are being transferred to Johannesburg, and it is expected that some forty students will be in residence here at the beginning of next academic year (February).

To provide lecture rooms and laboratories for these students, the council of the Institute has taken over from Government the lease of the Boys' High School in Kerk Street, while a row of houses in Highfield Terrace will be furnished for boarding accommodation.

The council, aided by a committee at home, is making the necessary appointments to the teaching staff. Already

Prof. Hele Shaw, of Liverpool, has been appointed senior professor, and he will be in charge of the department of mechanical and electrical engineering, with Prof. Orr, late of Kimberley, as assistant professor. The chair of mining engineering and the assistantship in that department have not yet been filled, but arrangements will soon be completed for the due carrying on of this department.

The courses at present provided by the Transvaal Technical Institute are those of the third and fourth years of the Cape mining curriculum arranged by the University of the Cape of Good Hope, but the council has under consideration the development of the Institute, so as not only to give a complete four years' mining course, but also to provide courses in other departments of engineering and technical education generally, and to provide post-graduate courses for mining engineers.

Evening classes in subjects bearing on certain trades and industries are already being carried on in Pretoria and in Johannesburg, and the council is preparing a scheme of technical instruction for mines employees and others which involves the early opening of evening and day classes along the line of Reef, and eventually in other parts of the Transvaal.

The council of the Institute has also under consideration the wider proposals recommended by the Commission on Technical Education, and it is intended that no undue delay shall intervene in the carrying out of these.

JOHN ROBINSON (Secretary).

Transvaal Technical Institute, Secretary's Office,  
Johannesburg, December 23, 1903.

#### The Quadrantid Meteor Shower of 1904.

THE evenings of January 2 and 3 were clear here, but the moon being full and near perigee, rendered invisible in the north-eastern sky all stars less bright than second magnitude. A brief watch before midnight on January 2 indicated a total absence of meteors, and it was not thought advisable to prolong observations on this night, as it had been previously determined by the writer that it was on the following night that the Quadrantid maximum would occur.

The calculated time of this maximum was January 3, 18h. G.M.T. On the same night there was an earlier, and what had been supposed would be a much weaker, maximum at 13h. Observations were therefore commenced here shortly after midnight, and it very soon became apparent that, notwithstanding the strong moonlight, shooting stars were unusually numerous. Between 12h. 5m. and 13h. (Dublin time) there were observed 17 meteors, of which 8 were as bright, or brighter, than first magnitude stars. They made their appearance at very considerable distances from the Quadrantid radiant, and, owing to the very limited number of fixed stars visible in that quarter of the sky, it was impossible to record the meteor-paths with accuracy, but several of the latter indicated a divergence from the region of Boötes, there being at the same time another probable centre of emanation near the tail stars of Ursa Major.

The advent of clouds from the south-east rendered observations impracticable or fruitless between 13h. and 14h. 15m., but during the first quarter of an hour succeeding this interruption 4 more meteors were seen, of which 2 were of first and the rest of second stellar magnitude. The early maximum of the night was now evidently declining, as in the next half hour but 3 shooting stars were visible, the two brightest of these being only of second magnitude. The two hours' interval between 15h. and 17h. was remarkable for its meteoric paucity, only 1 bright meteor equal to second magnitude having been observed during this period at 15h. 30m., though the sky was very clear; and the watch would very probably have been abandoned after 15h. but for the maximum expected some hours later. This anticipation of a recrudescence of the phenomenon was fully realised, for between 17h. and 17h. 30m. 10 meteors were observed (half of them of first magnitude), although two-thirds of the eastern sky had by this time become covered with light clouds. The meteors radiated in all directions from a region very evidently situated in the north of Boötes. In the next ten minutes 2 more Quadrantids were observed,

although the clouded area had by this time increased to five-sixths. Observations were discontinued at 17h. 40m. The meteors had a fairly rapid motion, and were slightly red in colour. Their paths ranged from  $10^\circ$  to  $20^\circ$  in length. The excessive moonlight must have detracted considerably from the splendour of the present display, but, even as it was, the meteoric rate during the shower's activity was much higher on the night of January 3 than on the corresponding night in 1903.

Dublin, January 13.

JOHN R. HENRY.

#### M. Blondlot's *n*-Ray Experiments.

It would be interesting to know whether anyone has succeeded in confirming the above, as described in your columns and elsewhere.

Personally, I have repeated most of M. Blondlot's experiments, but I have not been able to discern the slightest trace of any of the remarkable phenomena that he describes. This is also the case with Mr. J. C. M. Stanton and Mr. R. C. Pierce, who have assisted me in the investigations.

In order to get away from personal physiological idiosyncrasies we have also applied delicate photographic methods of observation, but without result, and as a general conclusion I am inclined to think that M. Blondlot's observations must be due, not to physical, but to physiological processes, and further, that these are not operative in the case of all persons.

Perhaps others may have tried the experiments and may have met with greater success.

A. A. CAMPBELL SWINTON.

66 Victoria Street, London, S.W., January 19.

#### Phosphorescence of Photographic Plates.

SOME time ago when developing an X-ray photograph I observed the effect noticed by your correspondent in your last issue. Very little of the silver salt had been affected, and the plate, after development, when put into alum solution lit up as described. I have often watched for the same effect since with ordinary negatives; sometimes there is phosphorescence, sometimes not. Apparently a fairly long development with the pyro soda is necessary. Not only the plate itself, but the used developer will give the phosphorescence with alum solution. Dilute sulphuric acid may be used instead of the alum. Quinine sulphate or hydrochloride does not light up when the used developer is added, but will do so if a few drops of sulphuric acid are subsequently introduced. Printing out paper may sometimes be successfully used instead of the plate, or the experiment may be still more easily made by mixing potassium bromide and silver nitrate solutions in dim. gaslight, decanting, and shaking up the resulting silver bromide with pyro soda. A red liquid results which gives the lighting up effect when poured into alum solution or dilute sulphuric acid.

H. J. EDWARDS.

Heaton, Newcastle-on-Tyne, January 16.

#### BIRD-LIFE IN WALES.<sup>1</sup>

ALTHOUGH the writings of Messrs. Murray Mathew, Cambridge Phillips and others have made us more familiar with the avifauna of southern Wales than we are with that of some other parts of that country, Mr. Walpole-Bond's description of the bird-life of a part of the district is not any the less welcome and instructive. For he enters very fully into the nesting habits and comparative abundance or scarcity of the birds in a way that is only possible to a good climber, indifferent to weather, who is able to devote every day wholly to the pursuit of his favourite study. The wild Wales of this book seems to lie, in the main, in part of the county of Brecon, although Pembrokeshire and other districts are touched upon. Incidentally, Bucks, Kent, and Hampshire are mentioned.

<sup>1</sup> "Bird Life in Wild Wales." By J. A. Walpole-Bond. Illustrated with photographs by Oliver G. Pike. Pp. xv+283. (London: T. Fisher Unwin, 1903.) Price 7s. 6d.